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A Durability Test of Wood Posts in Hawaii...First Progress Report

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ABSTRACT: Exposure of double-diffusion treated and untreated posts of Hawaii-grown wood shows that untreated 3- to 5-inch posts of 10 species will last from less than a year to 2-1/2 years, depending on species, and that the treated posts are beginning to fail after 2 years in the soil.

In September 1961, we set out posts of 10 species of Hawaii-grown wood at Makiki Valley, Honolulu, for an exposure test of their resistance to decay and termites.[1] The test was of untreated posts and posts that had been preservatively treated with copper chromate-copper arsenate by the double-diffusion process.[2]

Inspections, conducted every three months during the first 2 years of exposure, have already begun to supply meaningful results (table 1). The exposure has not continued long enough to yield much information on the treated posts, but data for the untreated posts are fairly conclusive.

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[1]Skolmen, R. G. Treating costs and durability tests of Hawaii-grown wood posts treated by double-diffusion. U.S. Forest Serv. Pacific SW. Forest & Range Expt. Sta. Res. Note 198, 5 pp. 1962.

[2]Baechler, R. H. How to treat fence posts by double-diffusion. U.S. Forest Serv. Forest Prod. Lab. Rpt. 1955, 6 pp., illus. 1962

So far the limited evidence indicates that double-diffusion treatment of the species under test probably will not result in the same long service life obtained with pine posts treated by this process and tested in Mississippi.[3] Several species are already beginning to fail after only 2 years in the soil. An analysis of copper penetration and chemical retention at the Forest Products Laboratory[4] indicated that retention in all species exceeded 1/2 pound of chemicals per cubic foot (table 1). But penetration of copper (not shown in table) was poor for all species except saligna eucalyptus, Norfolk-Island-pine, and ohia. Further experiments in treatment aimed at improving penetration are needed.

The data for the untreated control posts indicate that saligna eucalyptus was least durable--probably because almost all the posts of this species were entirely sapwood. Longleaf casuarina ("Ironwood" in Hawaii) also was low in durability. Ground termites are apparently a more serious hazard to posts of bluegum eucalyptus and Norfolk-Island-pine than is decay. Termites also destroyed the sapwood of sugi posts and were almost as serious a menace to the species as decay. Present evidence indicates that untreated bluegum eucalyptus, ohia, robusta eucalyptus, and sugi are the more durable of the post species tested.

Additional progress reports of this research will be made as more information becomes available.

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[3]Blew, J. O., and Kulp, J. W. Comparison of wood preservatives in Mississippi post study. U.S. Forest Serv. Forest Prod. Lab. Res. Note FPL-01, 15 pp., illus. 1963.

[4]Baechler, R. H., and Gjovik, L. R. The chemical analyses of posts of Hawaiian species treated in tanks by double-diffusion. U.S. Forest Serv. Forest Prod. Lab. 4 pp. (Limited distrib.) 1962.

Table 1. Condition of 3- to 5-inch Hawaii-grown wood posts, untreated and preservative treated with copper chromate-arsenate by double-diffusion, Makiki Valley, September 1963

Species	Posts in test	Average preservative retention[1]	Serviceable	Posts removed because of--			Average life[2]
				Decay	Decay termites	Termites	
	No.	*Lbs./cu. ft.*	*Percent*	*Percent*	*Percent*	*Percent*	*Years*
TREATED POSTS							
Bluegum eucalyptus (*Eucalyptus globulus*)	25	0.61	100	0	0	0	--
Brushbox (*Tristania conferta*)	25	.79	96	4	0	0	--
Longleaf casuarina (*Casuarina glauca*)	25	.65	88	12	0	0	3.0*
Norfolk-Island-pine (*Araucaria excelsa*)	25	.93	100	0	0	0	--
Ohia-lehua (*Metrosideros collina*)	26	.73	100	0	0	0	--
Robusta eucalyptus (*Eucalyptus robusta*)	25	.57	92	8	0	0	--
Saligna eucalyptus (*Eucalyptus saligna*)	25	1.03	92	8	0	0	--
Silk-oak (*Grevillea robusta*)	26	.91	92	8	0	0	--
Sugi (*Cryptomeria japonica*)	26	.77	100	0	0	0	--
Turpentine-tree (*Syncarpia glomulifera*)	26	1.15	100	0	0	0	--
UNTREATED POSTS							
Bluegum eucalyptus (*Eucalyptus globulus*)	25	--	72	0	8	20	2.5*
Brushbox (*Tristania conferta*)	25	--	36	52	12	0	1.7
Longleaf casuarina (*Casuarina glauca*)	10	--	0	100	0	0	1.0
Norfolk-Island-pine (*Araucaria excelsa*)	10	--	10	0	10	80	1.4
Ohia-lehua (*Metrosideros collina*)	25	--	68	32	0	0	2.4*
Robusta eucalyptus (*Eucalyptus robusta*)	25	--	60	32	8	0	2.3*
Saligna eucalyptus (*Eucalyptus saligna*)	25	--	0	92	8	0	.8
Silk-oak (*Grevillea robusta*)	10	--	50	10	40	0	2.1*
Sugi (*Cryptomeria japonica*)	25	--	68	16	4	12	2.4*
Turpentine-tree (*Syncarpia glomulifera*)	25	--	44	52	4	0	1.9*

[1] *Source: Baechler and Gjovik (1962). See footnote 4.*

[2] *True average only when more than 60 percent of posts removed; if less than 60 percent but ore than 10 percent were removed, asterisk indicates estimate made from fig. 3 in MacLean, J. D. Percentage renewals and average life of railway ties. U.S. Forest Serv. Forest Prod. Lab. Rpt. 886. 1957.*